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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,319	09/26/2003	Martin W. Weiser	H0004362	5332

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WELLS ST. JOHN P.S.
601 W. FIRST AVENUE, SUITE 1300
SPOKANE, WA 99201

EXAMINER	
NGUYEN, DILINH P	
ART UNIT	**PAPER NUMBER**
2814	

MAIL DATE	DELIVERY MODE
07/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/670,319	WEISER ET AL.	
	Examiner	Art Unit	
	DiLinh Nguyen	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (U.S. Pat. 5965945) (previously applied).

- Regarding claims 1 and 8-9, Miller et al. disclose a semiconductor package comprising a solder having an alpha flux of less than 0.001 cts/cm^2/hr (column 6, lines 25-28). The range of the alpha flux of less than 0.001 cts/cm^2/hr encompasses an alpha flux of less than 0.0005 cts/cm^2/hr; an alpha flux of less than 0.0002 cts/cm^2/hr or an alpha flux of less than 0.0001 cts/cm^2/hr.
- Regarding claim 2, Miller et al. disclose that wherein the solder predominately comprises Pb (column 6, line 25).
- Regarding claim 6, Miller et al. disclose that the solder is lead-containing solder that is at least 99 weight% lead [the solder having low-alpha lead and suitable additional constituent elements include: Au, Ba, Ca, Cu, Mg or Hg @ 1% by weight] (column 6, lines 25-61).

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (U.S. Pat. 5965945) (previously applied) in view of Schrock (U.S. Pat. 6221691) (previously applied).

Miller et al. substantially disclose all the limitations as claimed above except for the solder predominately comprises Ag.

However, Schrock discloses a semiconductor package comprising a die 10, a substrate 22, a solder predominately comprises Ag (column 2, lines 5-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the solder predominately comprises Ag because as taught by Schrock into the device structure of Miller et al. in order to improve the heat transfer from the die (column 2, lines 9-10).

4. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (U.S. Pat. 5965945) (previously applied) in view of Andricacos et al. (U.S. Pat. 6224690) (previously applied).

Miller et al. substantially disclose all the limitations as claimed above except for the solder predominately comprises Sn or the solder is substantially lead-free.

However, Andricacos et al. disclose a semiconductor package comprising a solder predominately comprises Sn or the solder is substantially lead-free (cover fig., abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the solder predominately comprises Sn or the solder is substantially lead-free as taught by Andricacos et al. into the device structure of Miller et al. in order to provide an interconnection structure suitable for the connection of microelectronic circuit chips to packages.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (U.S. Pat. 5965945) (previously applied) in view of Iwasaki et al. (U.S. Pat. 6777814) (previously applied).

Miller et al. substantially disclose all the limitations as claimed above except for the solder predominately comprises Bi, Cu or In.

However, Iwasaki et al. disclose a solder connection component predominately comprises Bi, Cu or In (column 6, lines 13-16). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the solder predominately comprises Bi, Cu or In as taught by Iwasaki et al. into the device structure of Miller et al. in order to enhance the reliability of the semiconductor device.

Response to Arguments

- Applicant's arguments, see pages 4-5, filed 5/2/07, with respect to 112 rejection for claims 1 and 7-9 have been fully considered and are persuasive. The 35 USC § 112 of claims 1 and 7-9 has been withdrawn.

Applicant's arguments filed 5/2/07 have been fully considered but they are not persuasive.

- The applicant argues that the Millar does not enable the claim 1 recited alpha particle flux of less than 0.0005 cts/cm^2/hr because Miller provides no teacher suggestion that there is a method suitable to achieve the claim 1 recited of alpha particles flux of 0.005 cts/cm^2/hr. Instead, the discussion in Miller indicates that an alpha particle flux of 0.001 cts/cm^2/hr is acceptable for the application described therein.

Applicant's arguments have been fully considered but they are not persuasive because Miller et al. disclose a semiconductor package comprising a solder having an alpha flux of less than 0.001 cts/cm^2/hr (column 6, lines 25-28). The range of the alpha flux of less than 0.001 cts/cm^2/hr encompasses an alpha flux of less than 0.0005 cts/cm^2/hr; an alpha flux of less than 0.0002 cts/cm^2/hr or an alpha flux of less than 0.0001 cts/cm^2/hr.

- Moreover, the applicant argues that Miller et al. never suggests any method which would enable formation of a solder having an alpha flux of less than 0.0005 cts/cm^2/hr.

It is noted that the process limitation does not carry weight in a claim drawn to structure.

Initially, and with respect to claims 1-9, claims are directed to the product per se, no matter how actually made. See In re Thorpe et al., 227 USPQ 964 (CAFC, 1985) and the related case law cited therein which makes it clear that it is the final product *per se* which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in Thorpe,

> determination of patentability is based on the product itself, *In re Brown,* 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington,* 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969);

Buono v. Yankee Maid Dress Corp., 77 F. 2d 274, 279. 26 USPQ 57, 61 (2d. Cir, 1935).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (571) 272-1712. The examiner can normally be reached on 8:00AM - 5:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DLN

HOAI PHAM
PRIMARY EXAMINER